(Fed. Cir. 1994); *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1997) ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."). Accordingly, reconsideration and withdrawal of this rejection is requested for the following reasons.

Prior to discussing the specific claims of the present application, general comments on the features of the heat exchangers of the cited reference and the present application will be presented.

The presently claimed heat exchanger and the heat exchanger of Hasegawa et al. have each have a fundamentally different form of construction. In particular Hasegawa et al. discloses, with reference to Figure 2, a plate-pair heat exchanger formed from plates 100. Each plate 100 has a generally U-shaped outward depression 101 which extends between inlet and outlet openings 106,107. A series of ribs 103 protrude inward from the depression 101. When two plates 100 are placed together, the U-shaped outward depressions 101 cooperate to form an internal U-shaped flow path between the plates 100 of the plate pair. This inner path extends in a U-shape between inlet and outlet openings 106,107. Inwardly protruding ribs 103 protrude into the U-shaped flow path, providing obstacles against the flow of fluid passing there-through. Figure 5 of Hasegawa shows plates 100 from two adjacent plate pairs that are separated by an air-side convoluted fin 123.

The presently claimed invention also relates to a plate pair heat exchanger, however the plates used in the present invention are very different from those used in Hasegawa. In particular with reference to Figures 2-7 of the present application, the plate pairs 20 of the present invention are formed from substantially planar plates 14 each having a series of externally or outwardly protruding ribs 32, 66, 68. Figure 3 shows an outer surface of a plate 14, and Figure 4 shows an inner surface of a plate 14. When the plates 14 of a pair are secured together, the outwardly protruding ribs 32, 66, 68 cooperate to form a generally U-shaped internal flow path within the plate pair 20, as best seen in Figure 7.

Thus, contrary to the heat exchanger of Hasegawa in which ribs 103 protrude into the internal flow path that is formed between the planar U-shaped outward depressions of plates in a

plate pair, in the presently claimed invention, the flow path is formed by the externally protruding ribs 32. Thus, the ribs 103 of Hasegawa extend into the internal flow path as obstructions, whereas in the presently claimed invention, the outwardly protruding ribs 103 form the internal flow path.

Turning now to the specific claims of the present application, with reference to Figures 2-7 of the present application, independent claim 1 is directed to a multi-pass plate pair 20 for conducting fluid in a heat exchanger. The plate pair includes two plates 14, each having at least two longitudinal columns of externally protruding ribs 32. The plates 14 are joined together with the columns of angled ribs 32 cooperating to form undulating first and second flow channels. The plates also include turn portions 36 that cooperate to form a first internal flow path for directing fluid from the upstream area of the first internal flow channel to the downstream area of the second internal flow channel and a second internal channel for directing fluid from a downstream area of the first internal flow channel to the upstream area of the second internal flow channel. Such as configuration directs the liquid that was at the leading edge of the plate pair in the first pass to the trailing edge of the plate pair in the second pass, and vice versa, thereby allowing for improved heat transfer.

Accordingly, among other features, independent claim 1 is directed to a plate pair structure that varies from that of Hasegawa in that (a) Hasegawa does not show outwardly extending ribs cooperating to form first and second flow channels, and (b) Hasegawa does not have a turn portion that directs fluid from an upstream area of the first flow channel to a downstream area of the second flow channel, and from a downstream area of the first flow channel to an upstream area of the second flow channel.

The claims that depend from independent claim 1 add further novel features, for example, claim 2 specifies that the cooperating turn portions of the plates 14 include cooperating outwardly projecting ribs 66, 68 that form the first and second internal flow paths through the turn portions.

Independent claim 8 is for a heat exchanger that is made up of heat exchanger plate pairs having features similar to the plate pair of independent claim 1. In particular, the plate pairs of

the exchanger of claim 8 include plates each having a longitudinal upstream column of outwardly protruding ribs that are angled relative to the longitudinal axis, and a longitudinal downstream column of outwardly protruding ribs that are angled relative to the longitudinal axis. The first and second plates are joined together with the angled ribs in the upstream columns of each plate communicating in a cross-over arrangement to define an upstream internal flow channel for the internal fluid and the angled ribs in the downstream columns of each plate communicating in a cross-over arrangement to define a downstream internal flow channel for the internal fluid. In a turn-portion of the plate pair, first outwardly extending ribs cooperate to provide a first internal flow path for the internal fluid between an upstream side of the upstream internal flow channel to a downstream side of the downstream internal flow channel, and second outwardly extending ribs cooperating to provide a second internal flow path for the internal fluid between a downstream side of the upstream internal flow channel and an upstream side of the downstream internal flow channel.

A heat exchanger having such features is not shown in Hasegawa.

Independent claim 15 is directed towards a plate pair for use in a multi-plate pair heat exchanger, and has similar features to the plate pair of claim 1. The plate pair of independent claim 15 includes upstream and downstream sides including a first internal flow channel and a second internal flow channel, respectively, defined by obliquely angled outwardly projecting interfacing ribs formed on the plates, the interfacing ribs on the first plate being oriented in an opposite direction than the interfacing ribs on the second plate, the plate pair including a turn-around end defining a first internal flow path connecting an upstream area of the first internal flow channel to a downstream area of the second internal flow channel, and a second internal flow path connecting a downstream area of the first internal flow channel to an upstream area of the second internal flow channel.

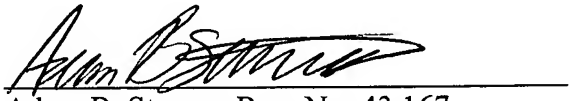
A heat exchanger having such features is not shown in Hasegawa.

Thus, for the reasons stated above it is submitted that the independent claims of the present application and the claims that depend therefrom include features that are not shown in the cited reference and accordingly the claims are not anticipated by the cited reference.

III. CONCLUSION

A genuine effort to resolve all issues has been made. For the above cited reasons, all of the claims presently pending in this application are believed to be allowable. Accordingly, Applicant respectfully requests that the rejection of Claims 1-20 under 35 U.S.C. § 102(b) be reconsidered and withdrawn.

Respectfully submitted,



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